SAFETYNET - BEYOND MOBILE DECLARATION

Rural and remote areas will continue to struggle to keep up with urban telecommunications despite the progress that has been made with initiatives such as the Mobile Black Spot Program (MBSP) and the NBN fixed wireless and satellite. But, now a more radical approach is needed as we consider updating the Universal Service Obligation, public safety network options and mobile roaming. Instead of more expensive small gains at the margin, or a counterproductive roaming arrangements, we should take a large step forward by having the Commonwealth, States and MNOs work together.

The SafetyNet model proposed here would:

- ✓ Resolve the conflict between coverage and competition which is prominent in all rural and remote communications programs and discussions.
- ✓ Expand the current, narrow view of what communications mean for rural and remote customers. In additional to conventional mobile network services, the SafetyNet solution will contribute to making land more productive and improving public safety.
- ✓ Reduce the inefficient use of public and private resources to meet the needs of rural and remote customers by taking a cooperative portfolio approach across governments and private operators.
- ✓ Improve the affordability of rural communications by reducing costs and providing more choices for end users.
- ✓ Resolve the issue of the 90,000 satellite users that the Productivity Commission's draft report on the USO estimates will have worse quality voice services when the existing copper network is decommissioned
- ✓ Relieve concerns about the future capacity of the Long Term Satellite Service; while providing better broadband service over LTE.

1. Achievements and Remaining Frontiers

A significant improvement in broadband communications for rural and remote Australia is underway with deployment of the NBN. Rural and remote residences and businesses will be able to get better fixed broadband – albeit at a price.

Mobile service availability has also improved at the margins with blackspot investment, and more people will be adequately served for mobile access - at least when near population centres. But there is a danger that relying only on this approach for improving coverage will come at a significant and growing cost.

Two frontiers remain - the IOT (Internet of Things) in rural and remote areas (needed to make things and land more productive) and public safety. These needs represent the next profound shift after moving from voice to data and then from fixed to mobile. We need networks that underpin everyday living, working and playing but not only through calls, texts or browsing but also by supporting the fundamental infrastructure that feeds us, transports us, provides power and water, and keeps us safe. It is foreseeable that these capabilities will be seen a foundational rather than add-ons in the near future and

fundamental to all Australians way of life.

2. Time to Step Back?

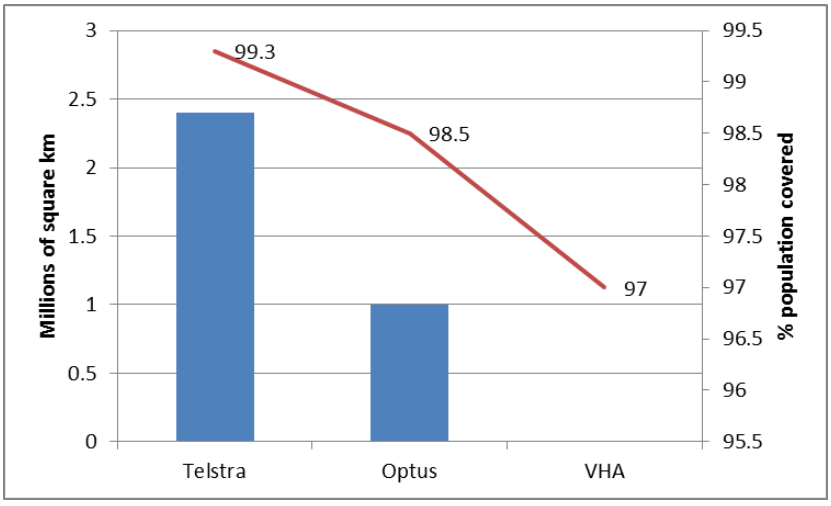
Many needs could of course be met by the mobile operators or, in truly rural and remote areas, by just one mobile operator[1]. This might indeed look like the inevitable end game given the difficult economics of each new network. But 2017 is a good time to step back and look at how best to meet the complete set of needs for rural and remote Australia. A quite different endgame might emerge if the States and Commonwealth looked at the overall portfolio of needs and networks that are being funded in rural and remote areas rather than continuing with the current ad-hoc, uncoordinated and piecemeal approach (e.g. NBN fixed wireless and satellite, USO, BlackSpots and Public Safety). States and Commonwealth must manage a portfolio of investments as an operator would – not as a collection of disparate policies overtaken by rapidly evolving requirements.

Country customers want improved mobile coverage more than they want competition. Because of rural economics, it is difficult to have both – unless policy makers consider more radical alternatives than the ACCC is able to contemplate.

A more holistic "SafetyNet" approach integrating various requirements and pooling resources would work with the demanding economics of the bush and allow retail competition despite coverage challenges

3. Coverage – the State of Play

The ACCC reports[2] that retail mobile services in Australia are currently supplied by three MNOs (Telstra, Optus and VHA) and more than 60 MVNOs. The three MNOs each operate national mobile networks and hold a collective market share of 90 per-cent of the retail market for mobile handset services.



Each of the three mobile networks covers over 97 per cent of where people live (with VHA's population coverage including that provided through roaming agreements with Optus). But customers want coverage even when they are not at home and Australia is a very big place.

[1] We acknowledge that other technologies (like LoRa) are likely to also have a role to play, but they are unlikely to obviate the need for wired or (where more practical) wireless interfaces to the wider Internet.

[2] Domestic Mobile Roaming Declaration Inquiry, October 2016

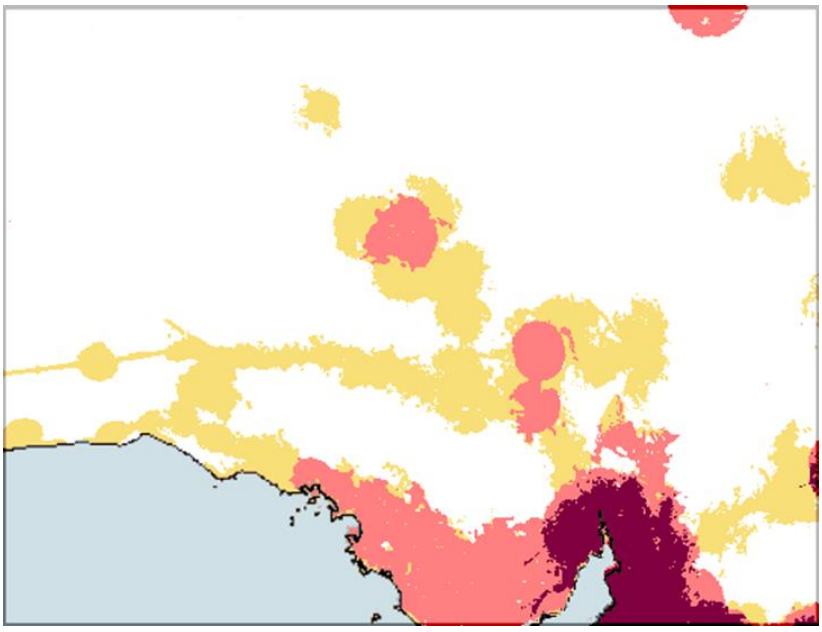
Telstra's mobile network covers a considerably larger geographic area than Optus' or VHA's mobile networks, such that for over 1 million km^2 Telstra is the only MNO with mobile coverage. While this is a large area, it covers sparsely populated regional and remote parts of Australia. Only 0.8 per cent of the population lives in areas where Telstra is the only MNO with coverage.

The total area of Australia is 7.7 million km$^{2.}$ While it would be foolish to aim for 100 per cent geographical coverage by terrestrial means, there are undoubtedly many benefits to be gained in extending mobile coverage beyond what any MNO would do for commercial reasons and well beyond the 97% that NBN has targeted with fixed wireless.

Telstra's superior geographical coverage is rewarded by its market share in regional Australia, which is significantly higher than in the national market. Optus has said that it has 22 per cent of the regional mobile market, Telstra a market share of 63 per cent in regional areas, and VHA a 6 per cent market share. Further, a survey conducted by the Victorian Farmers Federation of over 500 farmers across Victoria, found that 88 per cent used Telstra as their mobile service provider.

4. Natural monopoly at the Edges?

Head to head infrastructure competition in the more remote areas is neither likely nor efficient because once the first network is built in a location previously having no coverage there is not sufficient demand to justify a competitor building a rival mobile network.



As one moves away from the densely populated areas, the return on investment for MNOs becomes marginal - and the number of competing networks drops from three to two, then from two to one (mostly Telstra) and finally - for over 65% of Australia's landmass - from one to zero. This pattern is very clear if the coverage maps of the three operators are "massaged" graphically and amalgamated in a way that highlights the 3-2-1-0 coverage pattern - as shown here for South Australia (the darker the shading, the more mobile networks that provide coverage)[3].

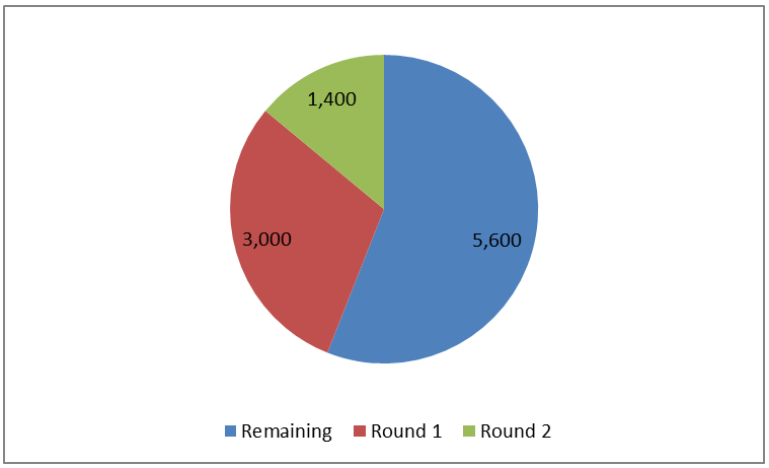
[3] This diagram was prepared around 18 months ago using published coverage maps by the three MNOs. It does not necessarily reflect coverage at the present time, nor does it attempt to take into consideration differences between coverage using a superior antenna, 2G/3G/4G differences etc. Despite these limitations, the reality it highlights is clear!

Although the ACCC agrees[4], it is torn between declaration and encouraging inefficient investment (*"In the absence of declaration, an access seeker will be incentivised to close the gap in coverage between it and MNOs with greater network coverage"*).

There is no easy way out of this conundrum. Declaration risks freezing-out further marginal private investment while encouraging infrastructure competition causes inefficiency. Getting the level of coverage sought by many including public safety agencies will need a different approach.

5. Mobile Black Spots

The Coalition Government is subsidising the extension of mobile coverage through the Mobile Black Spots Programme. $220 million in Commonwealth funds has been allocated across three funding rounds ($100 million for round 1, $60 million for each of rounds 2 and 3).



The first round was completed in June 2015, with 499 base stations covering 3,000 blackspots (see chart).

Round 2 announced[5] in December 2016 will deliver another 266 new and upgraded mobile base stations in regional Australia, covering some 1,400 black spots across 17,700 square kilometres, as well as 1,900 kilometres of major transport routes, and cover some 6,300 homes and businesses. The $60 million investment under Round 2 leveraged a total investment of $213 million, including funding from state and local governments, mobile network operators (Telstra, Optus, VHA), businesses and community organisations.

Rounds 1 and 2 cover 4,400 of the 10,000 black spots nominated by the public. Round 3 is expected to commence in early 2017. It should be emphasised that the 10,000 nominated blackspots by no means represent the entirety of underserved areas when a broader view of needs and opportunities is taken.

The programme has issues. It has been accused of cementing Telstra's monopoly with public funding and creating islands of alternative mobile operator coverage that require dual SIMs to straddle areas covered by, say, Telstra and Vodafone. Paraphrasing a comment made to the 2015 RTIRC: "*Thanks for the new Vodafone tower in our area - now I will need to maintain two mobile accounts, a Vodafone account for the area covered by the new MBSP-supported tower and a Telstra account for the surrounding area*".

Also, the Auditor General (ANAO) found, one in five of the mobile phone towers funded in

[4] "the economics of building mobile networks in Australia suggest that in many regional areas, it is likely that a mobile network exhibits natural monopoly characteristics. This means that once there is a mobile network, it may not be efficient for a second MNO to duplicate mobile infrastructure in those areas".

[5] https://www.pm.gov.au/media/2016-12-01/round-2-mobile-black-spots-program-deliver-266-base-stations

the first round of the programme provided little to no new coverage for consumers: "*public funding has resulted in substantial consolidation of existing coverage provided by grant applicants, as opposed to extending coverage in new areas—a key objective for the programme"*[6]. The auditor found 89 base stations received $28 million in funding despite providing minimal benefits to consumers in areas without any coverage. It also found that 39 of the 499 base stations would have been built anyway by private operators without needing public funding: "*The department did not assess whether an applicant's proposed base station location was listed on the work plan of another applicant…the department should review applicant proposals against the network expansion plans of other operators as an indicator of whether the programme is funding additional outcomes to normal commercial investment."*

As the programme continues and pushes into even more marginal areas, carrier returns will become more and more elusive. As a result, the MNOs' own appetite for contributing will progressively diminish and the level of community and public subsidy will increase. This also presents the Government with the right to "call the tune" in regard to programme rules.

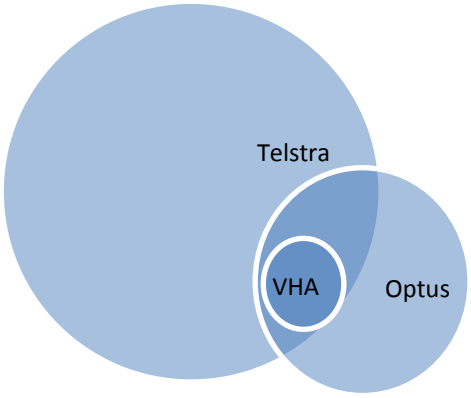
While small incremental benefits have been achieved at the margins, it is suggested that the money could be better spent on a more comprehensive solution.

6. The current roaming inquiry

The ACCC has considered whether to declare a mobile roaming service on two previous occasions: 1998 and 2005. In both cases, it concluded that no regulatory intervention was required as services would be offered through commercial negotiations.

Mobile roaming services are offered in some parts of the market on a commercial basis. Neither Telstra nor Optus offer coverage across the entirety of their networks. Optus provides roaming services to VHA in some areas where both Telstra and Optus have coverage.

This has tempted the ACCC to consider declaring mobile roaming services in areas where there are either one or two MNOs.



This would almost certainly chill further private investment by a second or third network operator in marginal areas – why overbuild the incumbent if you can access his infrastructure or roam over it?

[6] https://www.anao.gov.au/work/performance-audit/award-funding-under-mobile-black-spot-programme

7. Public Safety Needs and Opportunities

The network options for public safety remain controversial despite the ACMA allocating 800MHz spectrum and the Productivity Commission coming down on the side of operator networks. The main issues are the poor coverage relative to existing mostly voice legacy networks and a lack of trust that the commercial networks would deliver.

SafetyNet could deliver a very effective solution for the truly rural and remote areas especially if 450MHz could be made available. Some States would likely build their own urban core LTE networks perhaps leveraging transport LTE networks. Operators could then support the surrounding annulus on normal commercial networks and be benchmarked against both SafetyNet and the urban core safety networks.

8. What is to be done?

What we need is open access together with improved mobile coverage. This requires a coordinated response across Federal, State and Local Governments who manage important pieces of the puzzle for various purposes. The cross-government portfolio of telecommunications resources includes, or could include:

- Public Safety Mobile Broadband – with Land Mobile Radio for safety already very extensive in regional areas. We could replace existing 450MHz radio systems with national LTE infrastructure – ideally 450-470MHz, (subject to ACMA 400MHz band plan and LTE terminal availability), add 700 or 800MHz Public Safety spectrum managed by State public safety entities; but with an expectation of high availability of this spectrum for non-Public Safety applications.
- Spectrum - including the 450MHz LTE available to current Land Mobile Radio footprint plus, maybe, 700 or 800MHz spectrum.
- Black Spot funding – with governments having more regard to public interest (i.e. not the operators' commercial) requirements for improving land productivity through the internet of things, public safety and communications access and affordability
- USO and payphones funding
- Remote Indigenous Telecommunications programmes
- Wholesale network infrastructure for rural and remote areas:
    - NBN Fixed Wireless which is inherently a mobile technology, currently adapted to support fixed connections only. With appropriate engineering, the same base station electronics may be able to support both fixed and mobile connectivity. At worst, a separate set of base station electronics could be deployed on NBN Co FW sites - sharing access, tower, power and backhaul. Integrating FW and mobile coverage would thus boost the return on investment of NBN Co's FW sites, and/or
    - Inviting MNOs to provide NBN Fixed Wireless over their LTE infrastructure on an open access basis through the NBN; for profit.
- NBN Satellite - Traffic quotas are being imposed to stretch the life of limited satellite capacity, but if satellite users were liberated to use the network as freely as their urban cousins, the LTSS would very quickly become as saturated as the interim service. Once saturation is reached, it will be necessary to either acquire additional capacity or to shed around a quarter of users each year in order to maintain the same

level of performance for those continuing on the satellite service. Expanding the mobile and/or FW footprint in the underserved area would provide an alternative for displaced satellite users *(giving them improved performance as a bonus)* and avoid or at least defer the need to invest in additional satellite capacity.

- Some of the spending in sectors such as health and education, where exploiting opportunities made possible by better communications could yield significant offsetting savings.

Taken together, a common LTE wireless infrastructure could be used to meet a range of needs that individually have a poor business case. This solution needs the Commonwealth and States to manage their communications portfolios as a pooled resource and possibly add them to relevant commercial infrastructure.

Let's call the common infrastructure Australia's SafetyNet; a single fit for purpose LTE network for rural and remote areas. A single, open access network has better economics and would go a long way to meeting the aspirations of rural customers with greater coverage, capacity and scope.

An obvious candidate to operate SafetyNet is the nbn given its role the existing government owned, wholesale communications supplier. But, to this point it has not shown much inclination to sub-contract infrastructure (witness the greenfields fibre debacle) and some of its choices have been questionable (witness the choice of frequency for Fixed Wireless giving the poor coverage and high cost[7]).

Another, complication which needs to be considered is the possible future privatisation of nbn's fixed wireless and/or satellite assets. This might also be an opportunity to establish the nucleus of a commercially operated SafetyNet.

A possible alternative is to franchise the operation of a wholesale SafetyNet to an existing MNO or consortium of MNOs. In the area of public safety, capabilities such as Telstra's LANES technology have growing potential to support existing and emerging new needs of public safety agencies on the same infrastructure as provides mobile coverage.

It is in the interests of the MNOs to cooperate regardless of who runs SafetyNet:

First, to respect the MNO's investments and to ensure that public investment in SafetyNet does not stifle private investment, the mobile operators should be given the opportunity to put forward in confidence their committed plans for expanding coverage over *(say)* the next three years. Based on these plans, identify the residual area *(let's call it "the underserved area")* that has no prospect of achieving coverage through the operation of free market forces. This area is fair game for public investment and SafetyNet. If the MNO plans for expanding coverage do <u>not</u> materialise within the specified period, the boundaries of the underserved area could be expanded accordingly.

[7] We acknowledge that by using higher frequencies necessitating smaller cells, the nbn achieves more capacity per cell (useful in the context of delivering fixed broadband), and the shorter reach facilitates spectrum re-use in nearby cells. Also, requirements (and the suitability of spectrum) will vary depending on location - with higher frequencies and smaller cell sizes suited to some of the nbn's deployment scenarios on urban fringes, and lower frequencies and longer reach ideal for the more remote areas. Ideally, nbn should conscript other frequencies if and when it targets the more remote areas.

Second, governments and operators could become equity partners in SafetyNet based on the MNOs' contributions of infrastructure and the Commonwealth's contributions around the USO and/or public safety assets.

Australia's SafetyNet would provide network infrastructure for the rural and remote areas of Australia that would otherwise miss out on the availability of competitive mobile communications infrastructure and up-to-date public safety infrastructure. It also provides a safety net for those who cannot afford or use legacy communications – for example the homeless. Lastly, it will provide additional support for the Internet of Things in rural and remote areas to ensure the optimum use of Australia's natural resources. The financial goal for SafetyNet is to reduce the costs to the Commonwealth, the States and customers through building just one set of infrastructure for diverse applications.

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Robin Eckermann
Robert (Bob) James
John de Ridder